

ABSTRACT OF THE DISCLOSURE

The present invention provides an apparatus for performing biological reactions on a substrate layer having a multiplicity of oligonucleotide binding sites disposed thereon. The invention provides a hybridization chamber wherein nucleic acid hybridization is performed by reacting biological material on a biochip comprising a substrate having an array of oligonucleotide binding sites. The binding sites are associated with an array of 3-dimensional polyacrylamide pads for anchoring the reactants. The arrays are covered with a flexible layer that permits mixing of the hybridization solution on the biochip and detection of hybridization in situ. Fluid inlet and outlet ports into the chamber provide for control of fluid flow into and out of the chamber.